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ABSTRACT

To ascertain the characteristics and decision-making processes of physicians who choose to practice and remain in areas that have a shortage of physicians, a study analyzed the career decisions of National Health Service Corps (NHSC) and non-NHSC physicians (and spouses) with respect to the location of their medical practices. Another objective was to identify community characteristics influencing practice location. Findings indicated these implications for medical school selection: increasing the number of (1) rural physicians by increased selection of students from rural areas of high medical manpower need who are interested in general or family practice, remaining in their home region, and locating in a small or rural community and (2) physicians serving inner city minorities by increasing the number of minority and female physicians. Medical education should provide clinical training opportunities in rural and urban shortage areas and more residency programs in relation to regional shortages since practice region is positively related to region of terminal formal training. NHSC has been effective in permanently locating physicians in regions and small communities to which they otherwise probably would not have gone and in aiding willing physicians who needed support in establishing practices in needy communities. (YLB)

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Practice Location Decisions of NHSC and Non-NHSC Physicians

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Purpose of the study

The present investigation was designed to analyze the career decisions of physicians with respect to the location of their medical practices in order to ascertain the characteristics and decision-making processes of physicians who choose to practice and remain in areas that have a shortage of physicians. This purpose was coupled with the objective of identifying those characteristics of communities that tend to influence practice location, either alone or by interaction with physicians' characteristics.

Extensive data were gathered on the professional and preprofessional experiences of 486 physicians (and their spouses) who had made different decisions regarding the location of their present practices. The study was designed to be frankly exploratory, in order to see whether significant patterns of personal characteristics and experiences could be uncovered that relate to location and retention in underserved areas. The study was not designed to test hypotheses about a particular, small set of factors thought to be related to practice location; neither was it designed to provide representative national population estimates as to the proportions of physicians who have chosen or are likely to choose particular practice locations. A primarily exploratory work was considered necessary at the present time since previous research efforts generally have examined such limited sets of variables, or such limited periods of time in the life of the physician, that they have failed to provide information relevant to most of the major policy issues and interventions intended to remedy the geographic maldistribution of physicians as these confront agencies such as the Division of Medicine, which requested this study (Arasteh, 1974; DHEW; 1978; Otis, 1974).

The complete Final Report of this study is available (DHEW/BHM, 1979) and describes the methodology and results in detail. The present paper concentrates on the findings and their policy implications.

Conceptual framework

A conceptual framework was derived early in the study primarily to guide the development of the data collection instruments and suggest avenues for analysis once the data were collected. This framework, which will not be described here in detail, was modeled on the decision-making process proposed by Miller and Godwin (1972) and incorporated elements of Wise's analysis of choice behavior (1975). This model incorporated a wide range of personal and social factors as impinging upon the decision-making process and consequently having the potential for influencing the ultimate outcome of the decisions. Moreover, the interactions among these various factors, and a probable sequencing of their impact, were also suggested.

The model focuses on the individual physician (and the physician's spouse) existing in a particular professional setting and community at a given time. Both the physician and his/her spouse are viewed as having a set of preferences with respect to their careers and their place of residence. The purpose of the model is to describe the process by which these preferences develop and a decision on practice location is arrived at over the course of the physician's life.

This type of model suggests that in order to understand location decisions, the preference structures of physicians and their spouses should be examined in detail—with respect to both the types of practices and the places of residence they desire. The roles played in the decision process by individuals other than the physician should also be examined; in particular, the spouse's role and her/his preferences with respect to place of residence and own occupational role should be considered. And finally, the analysis should extend over time and describe the major stages in the physician's development and the impact of earlier experiences on the physician's preference structure and subsequent choices, as well as to describe how the experiences themselves were shaped by the physician's emerging plans and preferences as to his/her eventual medical practice.

The sample

The sample of physicians for the present study was chosen with several key objectives in mind, stemming from the specific questions to be addressed by this investigation and the underlying conceptual framework outlined above. First, the sample included physicians who have located in underserved rural areas, physicians in underserved urban areas, as well as those who have located in non-underserved rural and urban areas. The last group was needed in order to be able to draw conclusions about similarities and differences between physicians in shortage and non-shortage areas, as well as between those in rural and urban shortage areas. An attempt was made to have all four types of practice locations described above represented by samples large enough to permit reliable conclusions regarding the main characteristics being compared.

Secondly, physicians were included who had been exposed to practice in underserved areas and made a decision to (1) remain, (2) leave for a different underserved area, or (3) leave for a more adequately served area. The criterion of exposure to practice in an underserved area was the primary motivation for inclusion of National Health Service Corps (NHSC) physicians. Among NHSC physicians, those who had been out of the NHSC long enough to have settled in a permanent location, as well as those approaching the expiration of their service commitment and therefore at or near the point of decision-making, were included.

Thirdly, the samples of physicians were chosen to be comparable in terms of specialty and age, and the samples contain physicians serving in communities differing as widely as possible on the kinds of attributes thought to be related to location decisions.

The final sample for the study consisted of 486 physicians, divided into three basic subsamples as follows: (1) recent NHSC cohort—142 NHSC physicians who had off-site dates between 1 June and 31 August of 1978 (off-site dates

are the scheduled dates for completion of an initial 2-year commitment or any subsequent 1-year extension); (2) early NHSC cohort--195 physicians who entered the NHSC in its first 4 years of operation (1972-1976); and (3) non-NHSC group--149 physicians in private (non-NHSC, non-federal) practice who had never served in the NHSC.

The NHSC physicians were sampled from among all NHSC physicians listed in the NHSC's Complete Provider File on January, 1978, excluding those who served less than six months. The non-NHSC physicians were selected on the basis of their practice locations to form a balanced comparison group for the NHSC physicians in (1) and (2) above. Region, degree of medical manpower need, and degree of rurality were all criteria used in selecting appropriate practice locations for this subsample.

The specialty and present employment distributions of the final sample are shown in Tables I and II.

Data collection

The design of a data collection strategy that was commensurate with the broad conceptual framework outlined above, and yet feasible in terms of resources and requirements for physician time, was a critical problem. The main features of the approach and the priorities for data collection are outlined here. First, data collection concentrated on obtaining background data on those experiences thought to be most critical to the development of practice and residence preferences, and in such a way as to reconstruct a longitudinal history of past plans and the key decisions at each stage of career development. Second, greater emphasis was given to obtaining data on the selection of the present practice and the characteristics of this practice, and to decisions and experiences related to NHSC service. In the interest of controlling the amount of data collected, decreased emphasis was given to collecting data regarding the

Table I

Proportions of Physicians in Each Group Who Are in General/Family Practice, Other Primary Care Specialties or Other Specialties

	NHSC			
	Recent Cohort	Early Cohort	Total	Non-NHSC
General and Family Practice	58%	48%	52%	49%
Other Primary Care Specialties*	36%	38%	37%	37%
Other Specialties**	6%	14%	11%	14%

*Includes General Internal Medicine, Ob-Gyn, and Pediatrics

**Consists of Surgeons, Psychiatrists, Specialists in Emergency Medicine and Other Specialists.

Table II

Current Employment of Physicians by Subsample

	Recent NHSC	Early NHSC	Non-NHSC
Private Practice	33%	56%	86%
Other Medical Employment	11%	13%	12%
NHSC	25%	6%	1%*
Residency	23%	21%	0%
(Missing Data)**	8%	5%	1%

*One non-NHSC physician joined the NHSC just before the time of the interview.

**Includes those who returned partial data, but whose current employment cannot be classified.

medical school, graduate medical education, and college periods. Third, practice and residence preferences were measured directly using specially prepared preference inventories. And fourth, to the maximum extent possible, specific factual data were obtained by use of a brief self-administered questionnaire, while the personal interview was reserved for the exploration of plans, decisions, satisfactions, and other more subjective and evaluative data.

The major sections of the data collection instruments are shown in Figure 1.

Classifying practice location outcomes

The major analyses for the study centered around the identification of characteristics that differentiate physicians in different practice locations. Two dimensions of practice location were of central concern: the relative size of the community and how well the area was served medically. Each of the two variables defined by these dimensions was given only two values: rural/urban and medical manpower shortage/non-shortage, respectively. These values were then combined to yield the following four practice location types:

- Rural shortage
- Rural non-shortage
- Urban shortage
- Urban non-shortage

Each physician in the study was assigned one of these four classifications on the basis of his/her present practice location. Each NHSC physician was assigned an additional classification according to whether the most recent Corps site community had been in a rural or an urban shortage area.

Because of the relatively small sample size, this set of basically dichotomous classifications was used for most purposes in preference to a continuous classification of community size and degree of medical manpower need.

Figure I

Major Sections of the Data Collection Instruments
Used with Physicians and Spouses

Physician Biographic Questionnaire (PBIO)

- I: Family Background
- II: Educational History
- III: Specialization
- IV: National Service
- V: Medical Employment History
- VI: Other Activities
- VII: Marital History
- VIII: Present Residence

Spouse Biographic Questionnaire (SBIO)

- I: Family Background
- II: Educational History
- III: National Service
- IV: Employment History
- V: Other Activities

Physician Interview Form (PINT)

- High School
- College
- Medical School
- Internship
- Residency
- Public Health Service
- Present Practice

Spouse Interview Form (SINT)

- Background
- Period of Physician's Medical Training
- Period of Public Health Service
- Physician's Current Practice
- Present situation and plans

Medical Practice Preference Inventory (MPPI)

contains 42 individual items

Residence Preference Inventory (RPI)

contains 22 individual items

Residence Preference Inventory (RPI)

(same as physician's)

The first distinction--rural vs. urban--was made principally on the basis of the size of the community (rural = ≤20,000 population; urban = >20,000 population). Therefore, "rural," as used in this study, is primarily a short-hand way of connoting communities of less than 20,000. Other common attributes of "rural," such as an agricultural labor force, etc., tend to be associated with the communities in this sample, but are not key to the interpretation of the results.

Classifying communities as having a physician shortage or not is a more difficult task, both theoretically and practically. Physicians in the present study were tentatively assigned to a shortage classification for sampling purposes if they were practicing in a "whole" or "part-county" shortage area as designated by DHEW in March 1977. Before beginning the major analyses of the relationship of individual practitioner and practice characteristics to practice location type, it was necessary to go further and examine whether this classification, using area wide designations, conflicted in any way with the extensive information available through the personal interviews. After preliminary analysis, it was decided that the official 1977 DHEW designation of the county in which the practice was located would be used unless data provided by the physician during the interview indicated that the DHEW classification had been changed recently or that the physician's practice clearly deviated from the area-wide designation. This latter judgment was made on the basis of the physician's report of number of physicians available for informal consultation, the number and kind of specialists available for referral, the number and kind of other resources utilized by the physician, the average income of the physician's patients, and the number of patients on Medicaid. The reasonableness

of the resulting classification was checked using a variety of descriptors of social and economic conditions at the county level.

The resulting four-category practice location scheme classified 148 of the sample physicians as being in rural shortage areas, 73 in rural non-shortage areas, 73 in urban shortage areas, and 186 in urban non-shortage areas; the current locations of 6 recent cohort physicians who moved mid-way through the data collection were unknown. All practice location analyses were based on physicians currently in practice only, since those NHSC physicians who had resumed their graduate training were presumed not to be in their permanent practice locations and since virtually all of those in residency programs were (perhaps only temporarily) in urban non-shortage areas.

Findings

Findings of the study are summarized below in terms of the basic research questions with which the study began.

What are the similarities and differences between physicians who have located their practices in rural or urban shortage areas and physicians who have located in non-shortage areas?

With respect to the private (i.e., the non-NHSC) physicians in the present study, it is very clear that those in rural areas differ substantially from those in urban areas in many ways. Some of these differences have been observed in other studies; some have not. Physicians in the non-NHSC sample who are in rural areas are more likely than are urban physicians to be in general or family practice (see Column 1, Table III). The data also show that they are more likely to have been raised in a rural area (as indicated by previous research), to have a spouse who was raised in a rural area, to be practicing in the same region in which they grew up and/or did a residency, to have attended either

Table III

Percentages of Physicians Practicing in Rural and Urban Locations by Physician Background, Spouse Background and Primariness of Specialty

	Practice Location					
	Non-NHSC			NHSC		
	Rural	Urban	Total Sample	Rural	Urban	Total Sample
Physician Background						
Rural	58	26	43	38	30	35
Urban	42	74	57	62	70	65
N =	(69)	(62)	(131)	(136)	(103)	(239)
	$p(\chi^2) < .001$			$p(\chi^2) < .250$		
Spouse Background						
Rural	56	31	44	39	35	38
Urban	44	69	56	61	65	62
N =	(41)	(39)	(80)	(100)	(68)	(168)
	$p(\chi^2) < .025$			$p(\chi^2) < .750$		
Primariness of Specialty						
GP/FP	71	24	49	69	42	57
Other primary care	14	59	35	25	41	32
Other specialties	14	17	16	6	17	11
N =	(70)	(63)	(133)	(138)	(106)	(244)
	$p(\chi^2) < .001$			$p(\chi^2) < .001$		

a public college/university or a private denominational college (as opposed to a private non-denominational college), to have attended a medical school located in a relatively small community, and to have had residency experience in a private office or other non-hospital setting and/or in a rural area.

The results indicate that rural physicians also tend to have a distinct pattern of values with respect to characteristics of their medical practice and the community in which they reside. Among the more salient aspects of their practice-related values are a preference for solo or small group practice and a strong aversion to employment by a large institution (public or private), a preference for patient care activities and a disinterest in research and administrative activities, a lesser aversion than urban physicians to long hours and seeing large numbers of patients each day, and a preference for other aspects of a medical practice that are likely to be associated with practice in a small community--living in the same community as one's patients, being safe and secure, and avoiding a lengthy commute to the office.

Since the majority of the rural physicians are in general or family practice, they tend to reflect the preferences of such practitioners--preferences which exist whether the GP/FP is in a rural or an urban location. That is, these physicians have a somewhat lower concern than other specialists about the availability of resources, including specialists for consultation, CME, modern equipment and facilities, and other support services, and a lower concern with having a relatively high and/or increasing income. They also clearly value the attributes that typify general medical practice--continuity of care, responsibility for all of their patients' medical needs, and variety in the procedures and techniques they are called upon to employ. (Consistent with these preferences, the general and family practitioners reported that the variety of procedures performed and the close interaction with patients were major reasons for their choice of their specialty.)

In terms of the attributes of a residence community that they value, both rural physicians and their spouses do, in fact, prefer a less urban community, and one with more conservative values and greater access to outdoor sports and recreation, than do urban physicians and their spouses.

Identifying characteristics of physicians in shortage areas that differentiate them from those in non-shortage areas is much more difficult. "Shortage" does not seem to be a useful description by itself; rather, those in rural shortage areas and those in urban shortage areas seem to require separate descriptions. Private (non-NHSC) physicians in rural shortage areas appear very much like those in more adequately served rural areas, except that the attributes described above are even more pronounced (e.g., it is very rare for a non-NHSC physician and spouse who are both from an urban background to end up in a rural shortage area; it is somewhat less unusual to find such a couple in a rural non-shortage area).

One characteristic that does seem to distinguish non-NHSC physicians in shortage areas from those in non-shortage areas is that they tend to have had residency training in a non-hospital setting like that in which they have elected to practice, i.e., a private office or clinic in a rural area in the case of rural shortage physicians, and a clinic or larger health care facility in a low income urban area in the case of physicians in urban shortage areas. This is less true of their non-shortage counterparts, and the relationship may reflect an influence of the training experience itself or it may reflect self-selection into particular residency programs offering such training.

One final characteristic that appears to distinguish physicians in rural and urban shortage areas from those in corresponding non-shortage areas is a somewhat greater tendency to mention a desire to serve some particular patient

population as a reason behind various choices related to their education and practice. That is, shortage area physicians appear to have a somewhat greater tendency than other physicians to focus on the characteristics and needs of the patients they would be serving when they are selecing their training or practice.

The data in the present study have some limitations due to the relatively small sample size but they also suggest that urban shortage areas are more likely to include a substantial number of female and minority physicians than are the rural or urban non-shortage areas. Physicians in urban shortage areas are also more likely than those in other practice locations to be employed by a large clinic or hospital.

How do physicians in various locations differ in terms of the process by which they arrive at their location decisions?

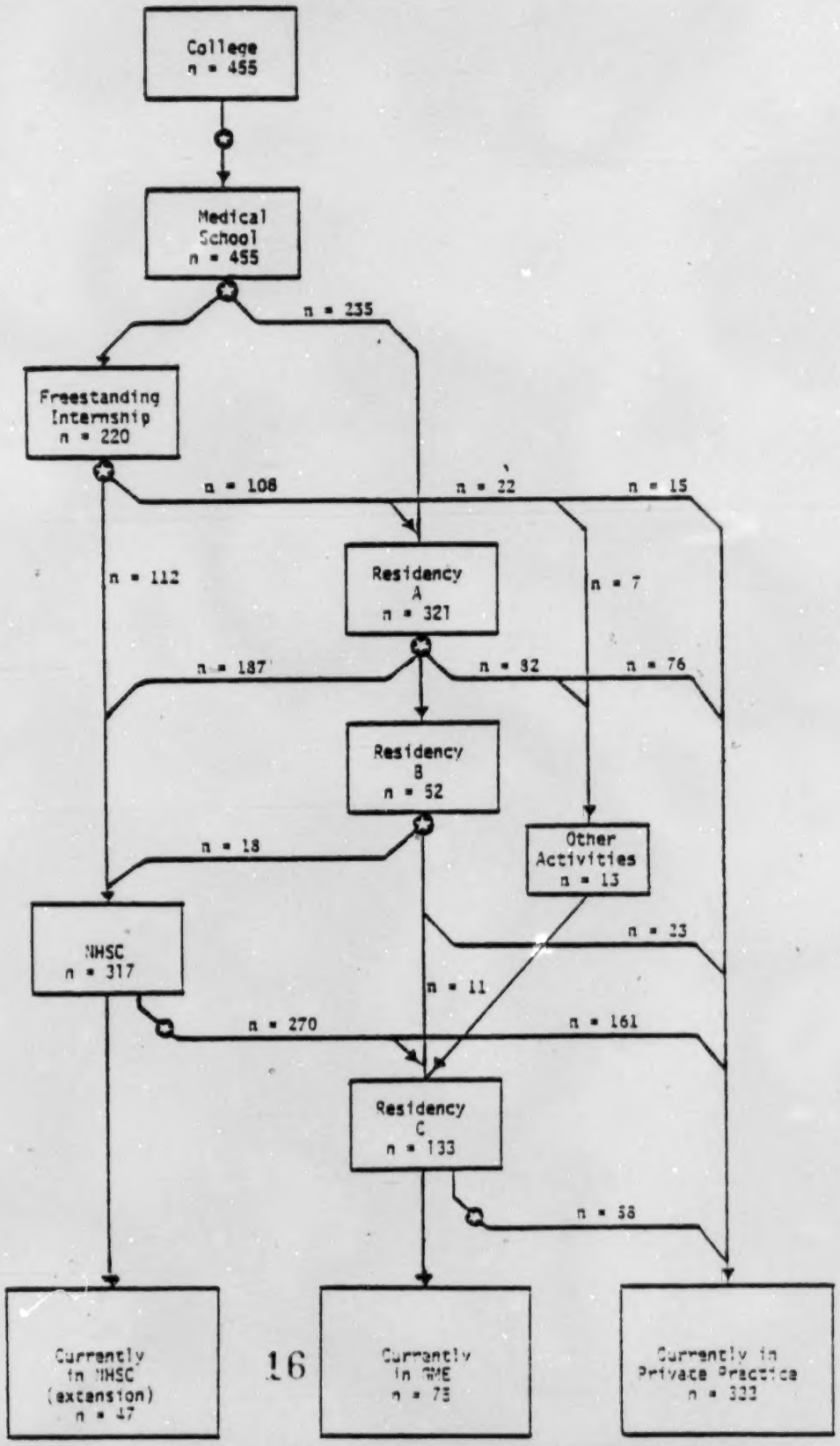
The analyses in the present study looked at "location decisions" as the end result of a series of interrelated decisions occurring over time. These decisions include the choice of:

- specialty
- professional activities
- patient population
- geographic region
- community size

By determining the stage in medical training (college, medical school, residency, etc.) at which each individual first decided on his/her present course of action with respect to each of these career parameters, it was possible to investigate which plans developed earliest or latest. The interview schedule was arranged chronologically, and Figure II shows the points in the interview at which the physician's career plans were recorded.

Figure II

Basic Medical Career Development Transitions Investigated*
(✪ Denotes stages at which career plans were examined.)



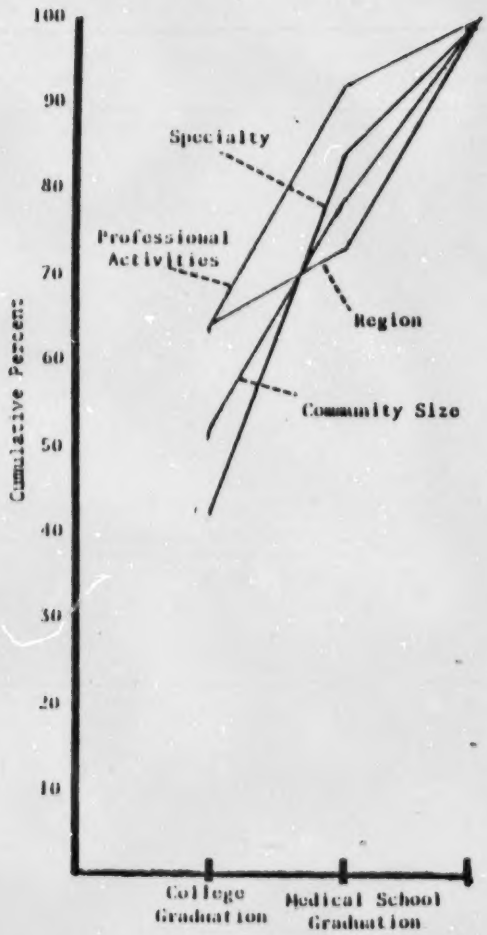
* Based on 455 cases with complete interview data.

For the non-NHSC physicians, it was found that eventual geographic region and practice community size, as well as the extent of involvement in patient care, are decided earlier than the eventual specialty, and this temporal difference is more pronounced for those who enter non-primary care specialty fields (see Figure III). For general and family practitioners, the location, professional activity, and specialty decisions tend to occur close together in time because the decision to enter general practice or family practice tends to occur relatively early compared with, say, decisions to enter Ob-Gyn or Surgery. Thus, it tends to go hand in hand with the choice of region and size of community and of patient care rather than other professional activities. Most GPs and FPs have decided on all five aspects of their career at least by the time they have completed medical school. A substantial number of those in other specialties do not arrive at a final specialty decision until they are into their graduate medical education. The primary care specialists, the pediatricians, obstetrician-gynecologists, and general internists appear to be intermediate between the other two groups in terms of the lag of their specialty choice behind their regional and community size choices.

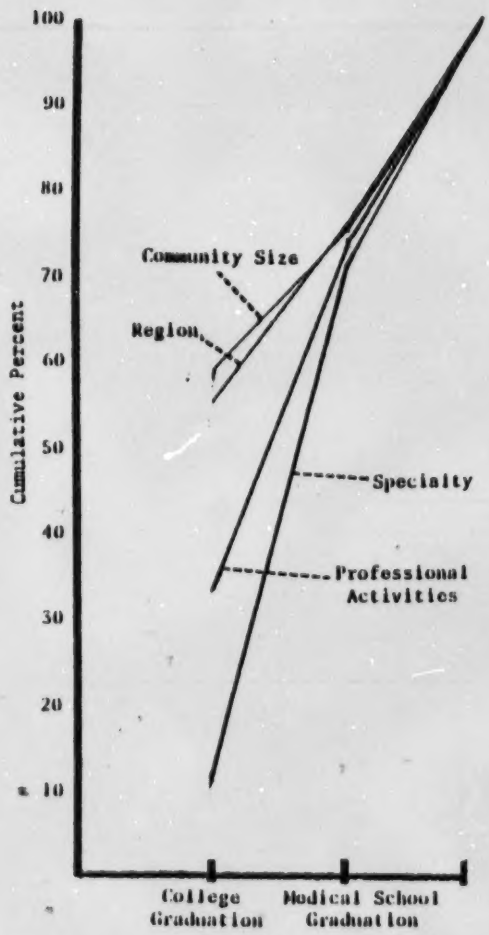
The fact that geographic and also professional activity choices tend to be made earlier than specialty choices does not necessarily mean that they are causal in determining the choice of a specialty. For some physicians, the compatibility of a specialty with practice in a small community was mentioned as a reason for selecting the specialty. However, the opportunities available for a physician in a particular specialty were also mentioned among the reasons given for choosing a community of a particular size. The size of the community and the region in which a particular training institution or practice opportunity was located, however, were significant factors in nearly <u>all</u> career decisions, from the selection of a medical school through the selection of a final

Figure III

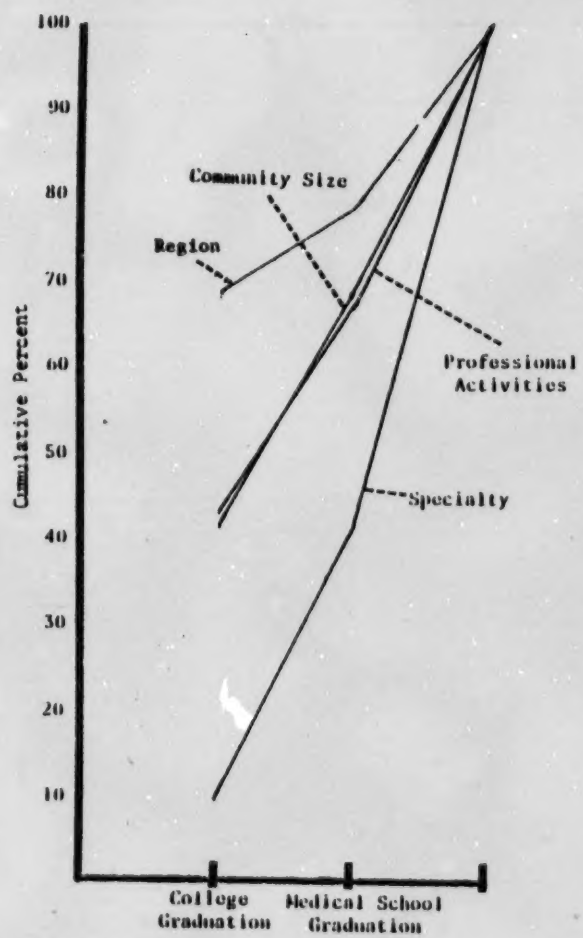
Cumulative Percentages of Non-NHSC Physicians Who Had Decided Upon Various Aspects of Their Medical Careers at the Conclusion of College and Medical School by Level of Specialization



General Practice/Family Practice
(N = 67)



Other Primary Care
(N = 22)



Non-Primary Care
(N = 47)

practice location. It is noteworthy that there was no support in the present data for the notion that the normal course of medical career development is for a choice of specialty to be made during medical training, with the size of the possible practice community then being essentially determined by the specialty choice.

The relative sequencing of the various career decisions that has been outlined above appears to vary most directly with the level of specialization chosen, but only indirectly with the type of practice location selected. That is, any differences in the relative timing of career decisions between rural and urban practitioners reflects differences between the decision pattern that characterizes GP/FPs and other primary care physicians who tend to locate in rural areas, on the one hand, and the pattern that characterizes more specialized physicians who tend to locate in urban areas, on the other. Physicians in shortage and non-shortage areas do not appear to differ in terms of the sequence and timing of their career decisions when level of specialization is held constant.

How do physicians with a history of NHSC service who locate in a particular type of area differ from physicians without NHSC service who locate in comparable areas?

The fact that geographic decisions tend to be made earlier than final specialty choices does not mean that such preferences are fixed and not subject to change. For the NHSC physicians studied, the pattern of career decision-making is somewhat different from that of physicians who have not served in the Corps, and it appears that an NHSC assignment in a small community in a particular region can have a substantial impact on the eventual location of physicians. This is true even for those physicians who, at the end of their medical school training, had planned to locate in an urban area or in a different

region from the site to which they were assigned (see Table IV and Figure IV). NHSC physicians were found to differ substantially from the non-NHSC physicians in that they were much less likely to be practicing in the region where they grew up, attended medical school or did a residency than were the non-NHSC physicians (Table V). The NHSC physicians who are still in rural areas are also much less likely to be from rural backgrounds than are rural physicians who have not served in the Corps. In fact, for Corps physicians, there is no significiant relationship between their current rural or urban location and whether or not they grew up in a rural area (refer back to Table III, column 2). This is an extremely important negative finding in that the relationship between background and location is highly significant for non-NHSC physicians in this study, notwithstanding the fact that the non-NHSC sample is smaller (149 non-NHSC versus 244 NHSC physicians currently in practice) therefore necessitating a more substantial correlation in order to obtain statistical significance. Moreover, the relationship of rural practice to rural origin has been such a stable finding in previous studies that it has almost become a truism.

One question that must be raised concerning this negative finding for NHSC physicians, of course, is whether the relationship would persist if the NHSC physicians still in residency programs were to be considered and if long-range intentions rather than present location were used as the outcome measure. The lengthy analyses implied by this question have not all been carried out. However, in the Phase I analyses, where background community size was examined in relation to planned size of the eventual practice community for all of the recent NHSC cohort physicians, regardless of their immediate practice or training plans, no relationship between rural practice and rural origin was apparent. With respect to geographic region, there is still a significant relationship between the current location of NHSC physicians and

Table IV

Percentages of Physicians Practicing in Rural and Urban Areas in Relation to Plans at End of Medical School by NHSC Site Community Type*

Plans at the End of Medical School	Current Practice Community Type		
	Rural	Urban	N
Planned to practice in a Rural Area			
NHSC Rural-Site Physicians	76	24	(71)
NHSC Urban-Site Physicians	50	50	(4)
Non-NHSC Physicians	82	18	(51)
Did not plan to practice in a Rural Area			
NHSC Rural-Site Physicians	56	44	(144)
NHSC Urban-Site Physicians	0	100	(23)
Non-NHSC Physicians	35	65	(85)

*Excludes NHSC physicians currently in residency programs.

Figure IV

Relationship of Current Region to Regional Preference at the End of Medical School by NHSC Service

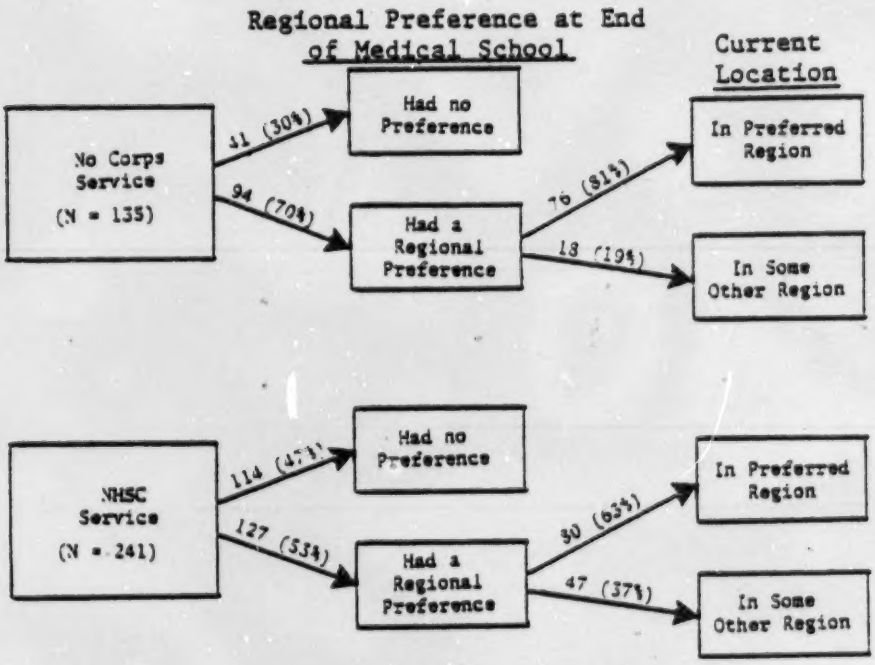


Table V

Percentages of Physicians in Each Region Who Attended High School in that Region, Compared with Total Physicians Attending High School in Region

	New Eng.	Mid East	Great Lakes	Plns.	South East	South West	Rocky Mtn.	Far West	N
NHSC									
Percent of those practicing in region who attended high school in same region	44	73	50	40	42	23	6	31	(240)
Percent of total sample who attended high school in that region	9	29	20	10	12	4	1	12	(240)
Non-NHSC									
Percent of those practicing in region who attended high school in same region	29	61	80	57	82	33	29	26	(133)
Percent of total sample who attended high school in that region	8	26	13	8	29	4	3	7	(133)
U.S. - TALENT Cohort[1]									
Percent of those practicing in region who attended high school in same region	20	69	76	57	39	47	19	22	(1258)
Percent of total sample who attended high school in that region	4	26	26	10	19	8	2	6	(1258)

[1]Data from Wilson, et al. 1979. Data are unweighted percentages for active physicians in practice, excluding those in residency training, from the high school classes of 1960-1963.

the region in which they grew up, but, as noted, this too is much less pronounced for NHSC than for non-NHSC physicians.

The finding that NHSC physicians' current locations in terms of geographic region and community size do not reflect their origins is echoed in the failure to find other significant relationships between current location and background for the NHSC physicians, where these relationships are quite marked among the non-NHSC physicians. Unlike non-NHSC physicians, NHSC physicians who have located in rural areas are no more likely than those now in urban areas to have attended private denominational colleges, nor are they more likely to schools in (relatively) small communities. NHSC physicians presently in rural practice, like their non-NHSC counterparts, do tend to be in general or family practice (see Table III), to have spouses with a level of education below that of the spouses of NHSC physicians in urban areas, and to have been exposed to residency training in smaller communities prior to their Corps service. Although the relationship does not attain statistical significance, NHSC physicians who have located in rural areas are also somewhat more likely to be male and from a majority ethnic background than are those who have located in urban areas.

Are there significant differences between NHSC physicians who remain in a rural shortage area after assignment there and those NHSC physicians who relocate to a non-shortage area?

In certain respects the results discussed above have answered this question in the negative. NHSC physicians who eventually locate in rural areas and those who locate in urban areas are not differentiable in the most expectable terms--namely on the basis of having predominantly rural or urban backgrounds. Since most of the NHSC physicians sampled were assigned to rural areas, this

amounts to finding that retention in a rural shortage area is not related to having a rural background. The results do suggest, however, that rural retention is better for NHSC physicians who are in general or family practice, worse for those in internal medicine, better for those with pre-Corps residency training in a non-hospital, rural setting, and better for those whose spouses do not have any graduate (post-baccalaureate) education.

However, such inferences are less satisfying than a direct investigation of the correlates of retention--considering only those NHSC physicians who were assigned to rural areas. For purposes of such an investigation retention was defined at several levels: (1) retention in the assigned NHSC site community, (2) retention in any rural shortage area, (3) retention in any rural area, and (4) movement to an urban area.*

The analyses that dealt directly with retention expanded the set of variables under consideration to include the physician's and spouse's attitudes and experiences at entrance vis-a-vis NHSC service, as well as the background and preference variables already discussed. Out of an examination of the responses to questions about reasons for joining the Corps, for selecting a Corps site community, and for--ultimately--leaving the Corps, a certain attitudinal theme emerged that did seem to distinguish the stayers from the leavers--particularly when the definition of retention was broadened to include practice in any rural shortage area (not just the site community.)

This general attitude, which was most apparent in the responses of the physicians themselves (as opposed to their spouses), and which appears to predate their entry into the Corps, can be characterized as a "readiness to settle down." This attitude was manifest in such responses as having joined

*Included here are both urban non-shortage and urban shortage areas, although practice in an urban shortage area could be considered as "retention" for some purposes.

the Corps in order to begin practice with no financial risks, and having selected a Corps site because it had good prospects for a financially independent practice and/or because it was in an area where the physician already had a desire to locate.

The opposite attitude, in which the physician appeared to be seeking new, but brief, experiences while he or she continued a process of personal and professional growth, tends to characterize the leavers. This attitude, which was apparent in such reported motivations as joining the Corps to gain some practical experience or to take a break from training, does not necessarily presage an unhappy or unsuccessful Corps experience, but it does tend to predict that the physician will eventually leave for a different type of practice area. (In this connnection it should be noted that number of years of pre-Corps graduate training correlates positively with retention, even though increasing amounts of specialization show the opposite relationship.)

No evidence was found that the physicians who entered the Corps in order to avoid the doctor draft or because of a scholarship obligation or loan repayment provision were any less likely to be retained at the site or in a rural area than those who volunteered without such incentives. This finding should certainly be explored further by systematic follow-up of the large numbers of NHSC scholarship recipients who will soon be ready to fulfill their obligation, since the present result is based on the small number who have served to date. In support of the present finding is the observation that the positive or negative tone of the physicians attitude at the time of actual entrance into the Corps was <u>not</u> related to eventual retention, nor was it the case that those who had an obligation to discharge were, in general, averse to doing so.

The physician's or spouse's overall level of satisfaction with the Corps experience also was not significantly related to retention and neither was the spouse's perceived degree of influence on decisions vis-a-vis the Corps (presumably the direction of the influence was related to or at least not in conflict with the physician's decision).

Diverse satisfactions and dissatisfactions with the Corp experience were reported by the physicians, but, again, the specific types of satisfactions or complaints bore only a marginal relationship to retention. If anything, the physicians who focused their complaints specifically on the problems of Corps operations—as opposed to more general community characteristics--were the ones who tended to remain in the site community or to move to another rural shortage community. Many of those who had Corps-operations centered complaints, however, do appear to have left Corps employment and converted to private practice because of the perceived operational problems--e.g. because they "wanted more freedom in the operation of the practice" or because they were "dissatisfied with the red tape and bureaucracy."

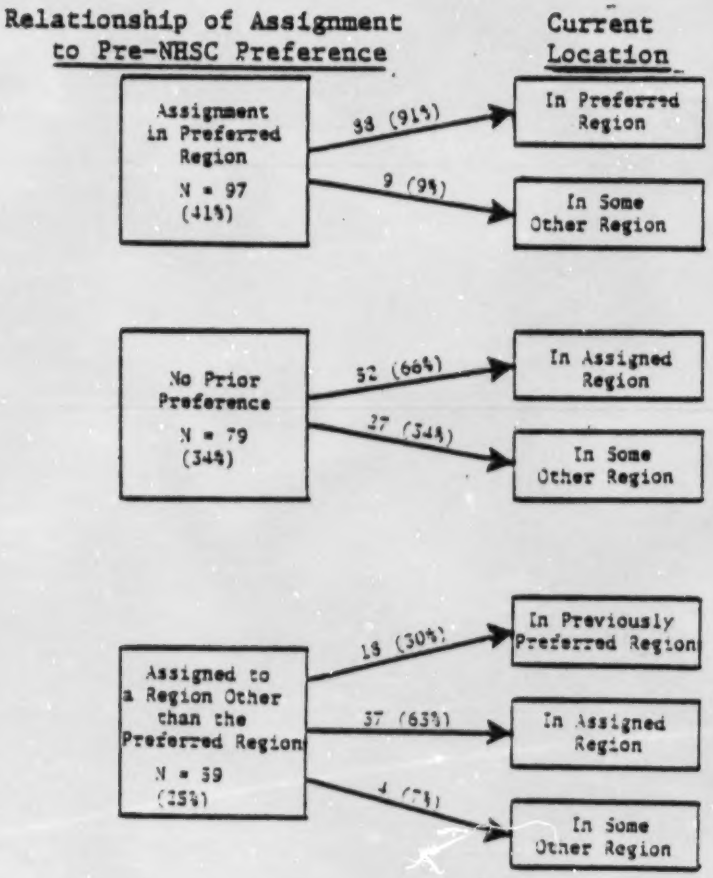
One element of the Corps experience that did affect retention was the extent of the match between the physician's preferences and the Corps site to which he/she was assigned. Although many physicians remained in assigned regions that were different from their prior preference, the likelihood of retention was greater when the physician was assigned to a previously preferred practice region (see Figure V).

What are the community attributes that influence the decision to leave a particular underserved rural community and relocate to a different community?

The clearest answers to this question were obtained when a "critical value" model of relationship between community characteristics and retention was used

Figure V

Percent of NHSC Physicians Located in Their Previously Preferred Region by Match of NHSC Assignment to Preference



rather than a linear model and when physician characteristics were held constant by comparing sites that retained NHSC physicians with sites that lost their physicians to other rural shortage areas. The critical value model states that there are critical values on certain community characteristics such that there is no relationship between retention and a particular characteristic for sites with values below the critical level, but above the critical value the characteristic becomes an important factor in decisions to remain in or leave the community. The characteristics identified as bearing a significant relationship to retention using this model include having a county-wide population density of 10 persons per square mile or less, a county-wide non-white population greater than 20% of the total, and a county-wide median family income of $8500 or less. These characteristics are not surprising, in fact they tend to parallel characteristics that differentiate well-served from underserved areas on a national basis.

Some physicians, however, will be retained even in the "least preferred" sites, indicating a definite interaction between physician and community characteristics in determining retention. Being assigned to a previously preferred region is important in this regard. For sites that are undesirable primarily on the basis of an extremely low population density, being married, being in general or family practice, and being tolerant of adverse climatic conditions are all significant. For sites that have lower retention apparently on the basis of their high proportion of non-white residents, the only physician characteristic that appears to make a difference in retention, other than assignment to a preferred region, is the racial background of the physician and his/her spouse. Non-white physicians are somewhat more likely to be retained in the site community under these circumstances.

Policy implications

Medical school selection. Except in the case of NHSC physicians, the results of this study are in line with previous findings that physicians who enter practice in rural areas are different from urban physicians in many ways. Moreover, the identified differences are such that many of them would be apparent even before the individuals' entrance into medical school. Thus one valid way to facilitate an increase in the number of rural physicians would be to increase the numbers of medical school applicants and entrants who display these characteristics. This would mean increasing the number of students who come from rural areas in geographic regions of high medical manpower need, who are not interested in research or teaching and are not primarily interested in the intellectual challenge of medical problems, but rather see medicine as essentially patient care, and who express an interest in general or family practice, in remaining in their home region or state, in locating in a small or rural community and in avoiding an area of high population density. Certainly on a predictive basis, although perhaps at the cost of some violence to social equity, an increase in the number of rural physicians would also be facilitated by an increase in the number of students enrolled who come from public or private, denominational undergraduate colleges, who have outdoor interests and who have spouses who are not planning an education beyond a college degree.

While the evidence is strong that a high proportion of prospective GPs and FPs actually formulated their specialty and location plans prior to medical school, the competitive pressure surrounding medical school admissions makes it easy to assume that it would be impossible to identify the desired candidates among others who might adopt a similar "appearance" in terms of their plans and interests. However, the advantages of a direct approach to assessing the potential of applicants with respect to rural practice are such that this approach should not be passed over without attempting such a procedure (e.g.,

asking applicants to indicate what they want to do, what they don't want to do, and why). The latter question, "why," may be particularly useful in that GPs/FPs tend to choose their specialty for reasons different from those of other specialists.

Similar strategies are also becoming possible with regard to specialty distribution since research is beginning to identify some of the objective background characteristics and interests that are associated with a choice of general or family practice versus other primary care specialties and non-primary care specialties (Wilson, et al., 1980). The present study gives some indication of the relevant interest patterns (e.g., a preference for variety in procedures and problems encountered rather than concentrated study of one topic or development of excellence/expertise in a particular area, and a preference for personal interaction over individual intellectual pursuits).

Results from the physicians in the Project TALENT longitudinal survey, which cannot be fully described here, suggest that the level of specialization of physicians is inversely related to the size of the family from which they come (Wilson, et al., 1980). More broadly, the TALENT results indicate a fairly strong sociocultural component in specialty choice, which, other things being equal, appears likely to be related to the values and interests of future students, to the activities and role models they tend to choose, and thus, eventually, to their specialty choices.

Attempts to increase the number of physicians serving minority populations, especially in inner-city areas, by increasing the numbers of minority and female physicians is a strategy that receives some support from the present study. One can speculate about the various reasons that this might be the case, but two interpretations suggest themselves based upon both the objective results and more subjective impressions gained from reading the interviews. The first is that minority

physicians do appear to be more likely to continue in practice in an area where a high percentage of the population is from the same minority background (although many exceptions in both directions can be found). This has historically been the case, but perhaps only partially by choice and partially by exclusion from other alternatives.

The second possible reason is more subtle. Health care in an urban underserved area is more likely to be delivered in larger institutions, and the advantages of or opportunities for employment in such settings, as opposed to solo or small group practices, may be greater for women and for minority physicians, at least at the present time. These probable advantages include the presence of an existing patient population, a more secure initial income, better control over work schedule, assured admitting priveleges, and so on.

What has been said above with respect to implications of physician characteristics for medical school admissions can be extended to the procedures used for award of NHSC scholarships as well. To the extent that the available scholarship candidates include a sufficient number of persons with the various characteristics that are associated with practice in a particular type of high need area, preference in awards could be given to such students. The present results and those from other recent studies suggest the kinds of criteria and application information that could be developed for this purpose. However, NHSC service can apparently have an influence on persons whose backgrounds and earlier plans did not suggest that they would locate in a rural area. This may mean that scholarships should not be awarded solely on the basis of such characteristics.

Medical education environment. The results of the present study carry a number of implications for the process of medical education. Certainly the provision of clinical training opportunities, at the graduate level at least, in rural and urban shortage area ambulatory care settings appears to be a necessary component of any attempt to increase the number of physicians in such areas.

Attention to the regional distribution of graduate training in relation to regional shortages in various specialties also appears indicated, since the region in which formal training terminates appears to have a significant relationship to practice region, both for physicians who choose a residency program in order to remain in or move to a desired practice region and for those who happen to train in a given region for other reasons unrelated to their future location plans. By inference, the residency appears to influence practice region in much the same way as does service in the NHSC, if it is the terminal experience prior to "settling down."

The results indicate that those physicians now in practice in shortage areas tend to see the faculties of their residency programs as having valued certain shortage area careers more highly than does the average faculty. Although this may simply reflect a tendency to reconstruct the past as more congruent than it really was, the most straightforward interpretation would be that these findings reflect some self-selection into the most suitable residency programs and give some support to the common belief in the influence of role models and medical socialization on the career plans of the trainee. Recruitment of faculty members who possess considerable enthusiasm for certain high-need aspects of medical practice would seem, on the basis of this evidence, to have some potential payoff.

National Health Service Corps program. The NHSC is becoming an increasingly important mechanism for the provision of medical services to underserved areas. The present results support the position that the Corps has in fact been effective in locating physicians permanently in regions and in small communities to which they would otherwise have been unlikely to go, based upon their personal backgrounds and previous plans. The NHSC also appears to have been a vehicle for facilitating the establishment of practices in needy communities by physicians who did plan to locate in a particular region and/or size of community prior to their

entrance into the Corps, but who would have found it difficult or impossible to do so without Corps support.

Other results have implications for procedures that could be implemented by the Corps to increase the rates of retention of physicians in rural communities and in particular regions. As has already been mentioned, the award of NHSC scholarships to persons with a high apparent potential for practice in some area of need could not help but increase retention, and the availability of such support could be a factor in encouraging appropriate students to enter medical school if they are now being discouraged in any way by lack of resources. On the other hand, assistance in establishment of a practice might be the best, or an additional, avenue of support for those <u>already</u> committed to practice in a high need area.

Given that study results also indicate that the Corps experience appears to <u>alter</u> the prior location plans of many physicians, it would also seem justifiable to direct scholarship support toward students who appear likely to enter a primary care field, but who have had no previous exposure to rural living. Their obligated service could then provide that exposure and might be sufficient to establish a commitment to a rural practice setting.

Retention of physicians assigned to rural sites appears to be facilitated by a matching of certain characteristics of the physician and the community. Physician characteristics whose influence is apparent in the present results include having grown up in the same geographic region as the site, having completed a pre-Corps residency in that region, and/or having had a preference for settling in that region. In addition, retention could probably be increased at sites in communities whose general attributes--such as low population density or high proportion minority--have tended to discourage physicians; this could occur if assignments were limited to those physicians who had some prior

exposure to that type of community and who could therefore make a more realistic appraisal of their own resources for coping.

Overall, however, the factor that appears to have the highest relationship to retention is the general readiness of the physician to settle down and establish a practice. Generally this presumes completion of formal medical training, an orientation toward putting one's accumulated experience into practice rather than continuing to experiment and accumulate new experiences, and the existence of a family that is ready to establish roots. It appears likely that the physician in such a situation may make a more realistic initial evaluation of prospective communities and, once having chosen, may develop more readily an investment in the community that tends to persist.

The foregoing is of course based upon the assumption that conversion of NHSC-supported site practices to private practices is the goal. If that is the case, then efforts to alter many of the factors tending to generate physician dissatisfaction with the Corps and the site administration appear somewhat less important than they otherwise might. Such dissatisfactions appear to motivate physicians to leave Corps employment, but not to leave the community; it is clear that most of the physicians distinguish between the characteristics of the community as a place to live, work, and raise a family; the characteristics of their patients as patients; the conditions of employment and the assistance that is or is not given by the NHSC; and the conditions generated by the community board and by other medical and non-medical staff assigned to, or employed by, the site. Hence the factors affecting their decision to stay in or leave the community may be quite different from those affecting their decision to stay in or leave the NHSC/PHS. Given the general aversion manifested by rural physicians to employment by large organizations, the retention of physicians in rural areas and in Corps service may not be a reasonable goal. In urban settings, however, the situation may be quite different.

If the goal of the NHSC for some or all types of sites were to be to obtain providers for a limited time commitment rather than for permanent practice in the community, the focus would shift to defining characteristics of physicians and of site operation policies and procedures that would facilitate provider productivity and satisfaction in an assignment of limited duration. From the physician's standpoint, the assignment would be an opportunity for service as well as an opportunity to gain skills in practice management and additional clinical experience, and a chance to evaluate aspects of practice and life in a potentially appealing practice setting. The factors that make this type of limited-duration experience successful have not been fully explored in the present study, but the interviews tend to suggest that the requirements are not unlike those for any successful training experience: a relatively stable (non-chaotic) administrative structure (free from competing political pressures) or else the opportunity to organize a satisfactory new situation/facility; a respected senior "mentor" or colleague from whom or with whom to gain new experience; and a manifest need for services on the part of the community. In order for this situation to exist, especially the first element of administrative structure, the role of the Community Board appears to be key. If the physician converts the site to a private practice, the board role dissolves, but otherwise it remains crucial. There is a strong suggestion in the interviews that, while many physicians had an extremely good relationship with their boards, in other instances the boards did not understand the operation of a medical facility, were unwilling or unable to secure competent non-professional employees at the site, or generally intruded political considerations into the operation of the site. The youth of many of the physicians may have exacerbated the inhibiting forces that prevented the board from granting them sufficient autonomy and authority (in their view), but it also seems plausible that some

gains could be made by a better orientation of board members to the operations of a medical facility and of physicians to techniques for dealing effectively with their role vis-a-vis the board. Of course, more major structural alterations in the present site organization would also be conceivable in response to these perceived problems.

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